C. D. TABOR.

ELEVATING PIVOT FIXTURE.

APPLICATION FILED JAN. 21, 1910.

1,010,979.

Patented Dec. 5, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

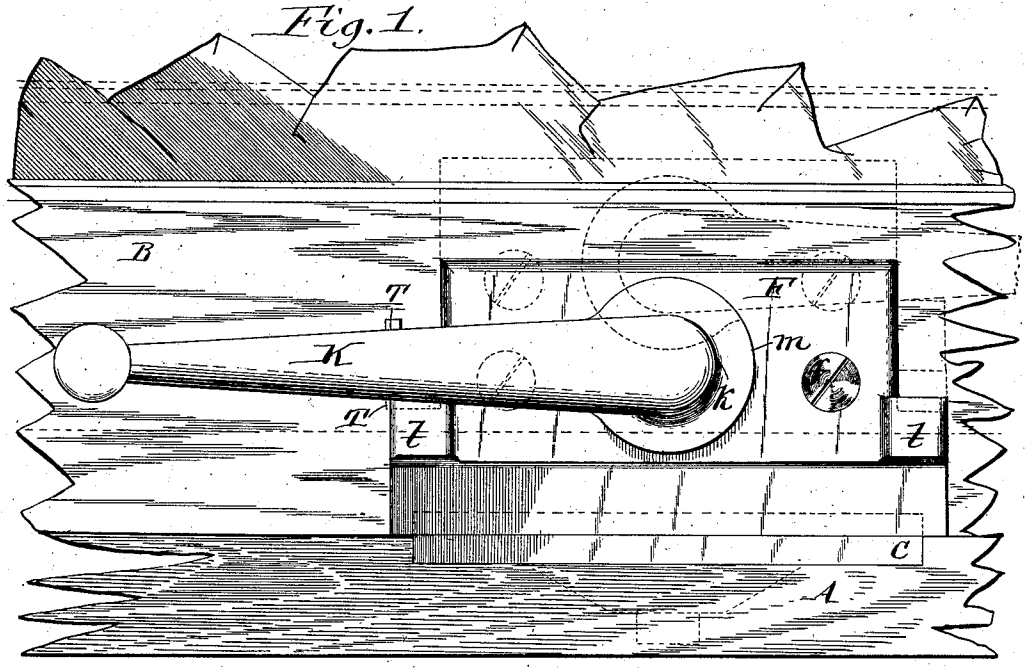
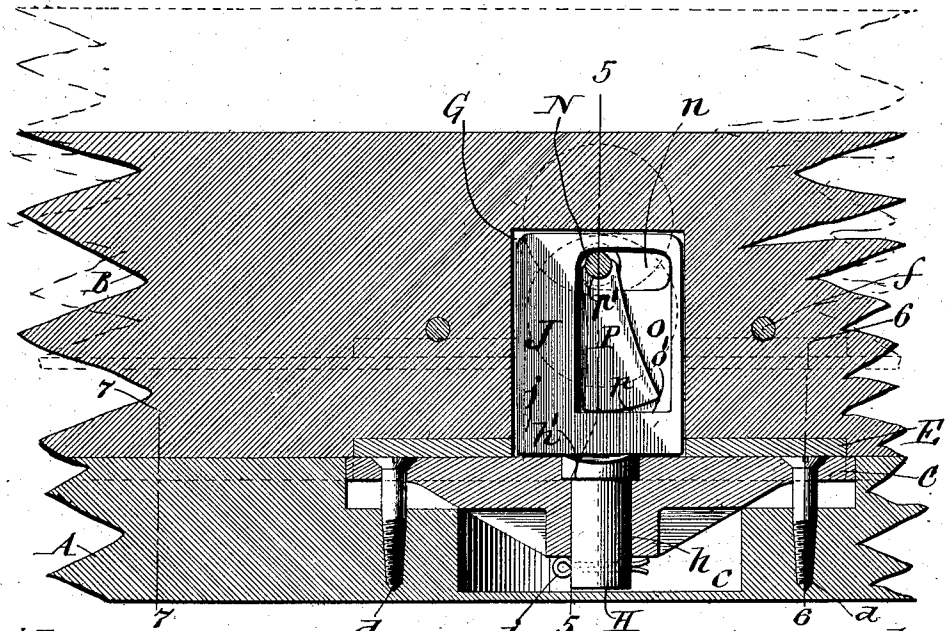


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

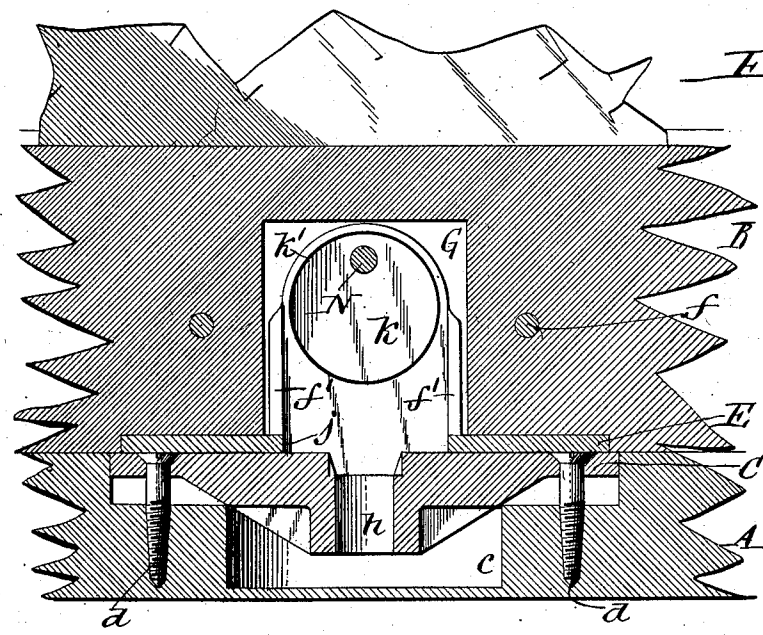
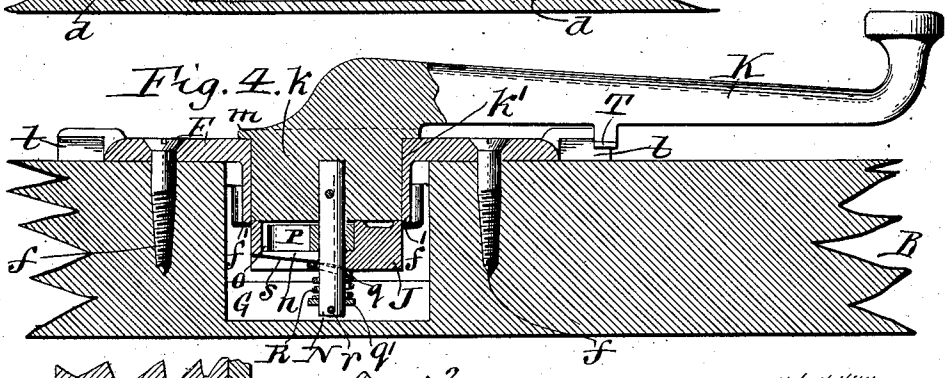


Fig. 4.



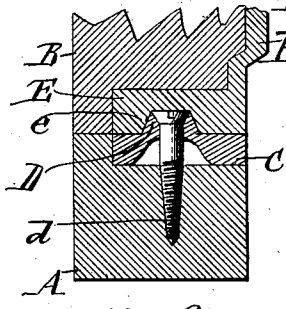


Fig. 6.

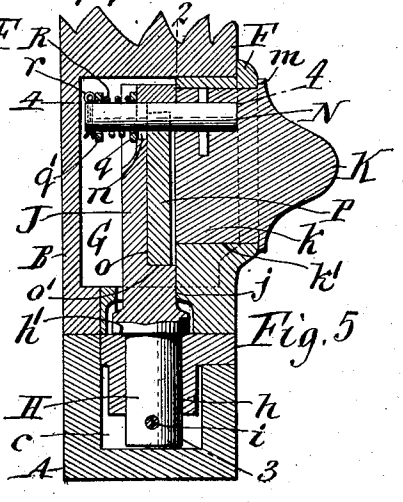


Fig. 5.

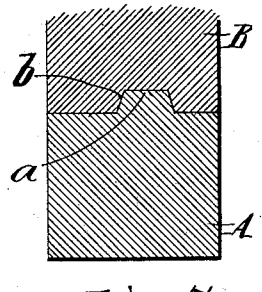


Fig. 7.

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3 SHEETS—SHEET 3.

Fig. 8.

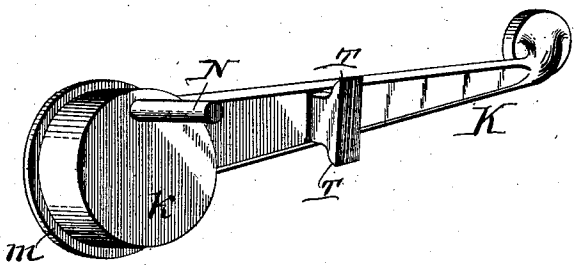


Fig. 9.

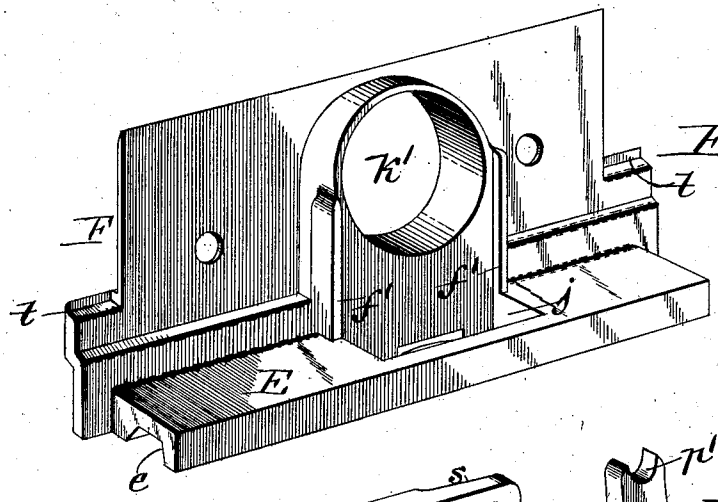


Fig. 10.

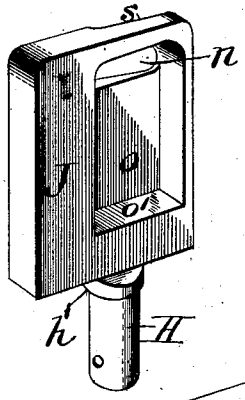


Fig. 11.

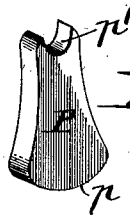
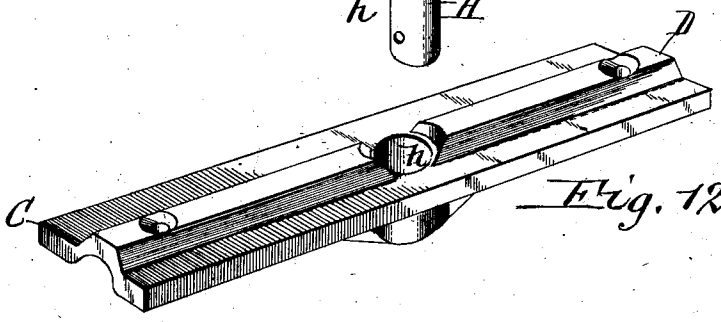


Fig. 12.



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UNITED STATES PATENT OFFICE.

CLINTON D. TABOR, OF NEW DORP, NEW YORK, ASSIGNOR TO TABOR SASH FIXTURE COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ELEVATING PIVOT-FIXTURE.

1,010,979. Specification of Letters Patent. Patented Dec. 5, 1911.

Application filed January 21, 1910. Serial No. 539,287.

To all whom it may concern:

Be it known that I, CLINTON D. TABOR, a citizen of the United States, residing at New Dorp, in the county of Richmond and State of New York, have invented a new and useful Improvement in Elevating Pivot-Fixtures, of which the following is a specification.

This invention relates to a window fixture whereby the sash is pivotally supported on a frame so that the sash can turn horizontally and the same can also be raised and lowered into and out of interlocking engagement with the sill of the frame.

It is the object of this invention to provide a fixture of this character which is very simple and durable in construction and not liable to get out of order, which reduces the friction to a minimum so as to permit of raising the sash easily and conveniently, which prevents undue removal of the load from the operating lever at either end of its stroke and thus avoids sudden movement and possible breakage of the lever at the end of its stroke in either direction, and in which the lever is prevented from being broken by a pull on the same lengthwise of its axis.

In the accompanying drawings consisting of 3 sheets; Figure 1 is a fragmentary inside elevation of a window frame and sash equipped with my improved pivot and lifting fixture. Figs. 2 and 3 are vertical longitudinal sections in line 2—3, Fig. 5 looking outwardly and inwardly, respectively. Fig. 4 is a horizontal section in line 4—4, Fig. 5. Figs. 5, 6, and 7 are vertical transverse sections in lines 5—5, 6—6 and 7—7, Fig. 2, respectively. Figs. 8, 9, 10, 11 and 12 are perspective views of different parts of the window pivot and lifting device.

Similar letters of reference indicate corresponding parts throughout the several views.

A represents the sill of the window frame and B the lower bar of the sash which are adapted to interlock in the lowered position preferably by means of a longitudinal rib *a* on the sill engaging with a longitudinal groove *b* on the underside of said bar.

Within a recess *c* in the top of the sill is arranged a sill or frame plate C which is preferably secured thereto by screws *d*, *d* and provided with a rib D on its upper side which forms a continuation of the rib *a* of the sill. Above the sill plate the sash is provided on the underside of its lower bar with a sash plate E having a longitudinal groove *e* on its underside which is in line with the groove *b* of the sash and which receives the rib of the sill plate. On its inner edge the sash plate is provided with an upwardly projecting face plate F which is secured to the inner side of the sash by screws *f*, *f* or any other suitable means. Above the sash plate and behind the face plate the sash is provided with a recess G which receives parts of the means for raising and lowering the sash and pivotally connecting the latter with the sill.

The means for pivotally connecting the sash with the sill and also permitting the sash to rise and fall relatively to the sill comprise a vertical pin H journaled in a bearing *h* in the central part of the sill plate and provided at its upper end with a collar or shoulder h^1 which bears against the upper side of the sill plate. The pin is held against upward movement in the bearing *h* by means of a cotter *i* extending through an opening in the pivot pin below its bearing. Projecting upwardly from the upper end of the pivot pin H through a longitudinal slot *j* of the sash plate and into the recess G thereof is a flat upright standard or stem J which fits said slot *j*. Upon moving the sash vertically the sash plate slides on the standard J and upon turning the sash after the same has been elevated until the grooves *b*, *e* clear the ribs *a*, D, the standard and pin H are compelled to turn with the sash. The standard is guided in the slot *j* and also between two ribs *f'* on the face plate F so that the sash is capable of rising and falling relatively to the pin H but the latter is compelled to turn horizontally with the sash.

K represents a vertically turning lever, crank or arm arranged on the inner side of the sash and having a cylindrical hub *k* which is journaled in a horizontal bearing or opening k^1 formed in the face plate F and provided on its outer end with an annular flange or shoulder *m* which bears against the outer side of the face plate and thereby serves as a stop to limit the rearward movement of the lever hub in its bearing.

On the inner end and within the recess G the lever hub is provided with an eccentric shifting stud or pin N which is preferably made separate therefrom and secured there-

to. The inner end of this lifting stud projects through a horizontal longitudinal slot *n* in the upper part of the pivot standard. On the side facing the hub and extending downwardly from its siot *n* the standard is provided with a pocket *o* which terminates at its lower end in a horizontal longitudinal shelf or shoulder o^1. Within this pocket is arranged a segment P which rolls with the periphery *p* at its lower end on the shelf o^1 while its upper end is provided with a concentrically curved seat or bearing p^1 in which the lifting stud rests between the lever, hub and said standard.

When the sash is in its lowered position the lever or crank is turned into a horizontal position and projects from the left side of its axis, as shown in full lines in Fig. 1. In this position of the lever the lifting stud is arranged above and vertically in line with the axis of the lever, as shown in Figs. 3 and 4. Raising of the sash from the outside of the building is at this time prevented by engagement of the stud with the upper side of the slot *n* in the standard, thereby rendering it impossible for burglars to gain access to the inside of the building by such method. When it is desired to raise the sash free from interlocking engagement with the sill preparatory to turning the same,—this is done by turning the lever one-half a circle from the position shown in Fig. 1 to a diametrically opposite position in which it projects horizontally from the right of its axis. During this movement of the lever the lifting stud is shifted from a position above the axis of the lever to a position below and vertically in line with said axis, whereby the sash is raised and held in this position by its weight. As the stud moves from its upper to its lower position relatively to the axis of the lever, it reciprocates horizontally in the slot *n* and is supported by the segment which rolls on the shelf of the standard first in one direction then in the other direction as it adapts itself to the changing position of the lifting stud. By thus supporting the stud on the rolling segment instead of causing the same to bear against the lower side of the slot *n* of the standard, the friction produced in raising and lowering the sash is reduced to a minimum and renders it possible to operate the sash easily and without any appreciable wear of the parts. In addition to serving as a stop for preventing raising of the sash from the outside of the building, that part of the standard above the slot *n* also operates to prevent the stud N from being bent as it supports the weight of the sash while the latter is elevated.

For the purpose of holding the hub of the operating lever in proper engagement with its bearing, a tension device is provided which constantly moves the hub inwardly so that its collar or shoulder *m* engages with the outer side of the face plate and the lifting stud remains in engagement with the segment and the slot *n* of the standard. This tension device may be variously constructed but preferably comprises a front washer *q* arranged on the lifting stud and engaging with the rear side of the standard opposite to that of the pocket *o*, a rear washer q^1 arranged on the rear end of the stud and engaging with its rear side against a cotter pin *r* in the stud, and a spiral spring R arranged on the stud and engaging at its front and rear ends against the front and rear washers *q*, q^1, respectively. The spring R exerts a constant rearward pull on the stud and the hub connected therewith and thereby retains these parts in the proper assembled position in which the shoulder *m* of the hub engages with the face plate. By employing this tension device it avoids the necessity of accurately fitting these parts to each other and also prevents rattling inasmuch as any slack between the parts due to slight inaccuracies or wear is automatically taken up by the spring R.

It has been found in practice that, in the absence of any provision to prevent it, the load upon the lever at the end of its stroke in either direction is reduced to such an extent, owing to the nearness of the stud at these times to the dead center line of the lever hub, that an operator when turning the lever is liable to complete its stroke so quickly that the lever is in danger of being broken. To avoid this, means are provided which operate to increase the resistance to the movement of the lever at either end of its stroke in order to off-set the increasing leverage of the stud as it approaches closely to the dead center of the lever, and to decrease the resistance to the movement of the lever during the central part of its stroke so as to compensate for the decreasing leverage of the stud which at this time is arranged at the side of the dead center of the lever.

The tension spring R, standard and associated parts are preferably utilized as part of the means for thus increasing and decreasing the load on the lever by providing the rear side of the standard with an inclined or cam face *s* which extends horizontally along the upper and lower edges of the slot *n* therein and which is engaged by the front washer *q*. This incline or cam face has its highest part arranged transversely and vertically in line with the axis of the lifting lever and gradually lowers from this place toward the right or that side thereof toward which the stud moves laterally in changing its position from above to below the axis of the lever or vice-versa. By this means the spring R is permitted to

expand as its front washer *q* moves from the high part to the low part of the cam face upon turning the stud toward one side of the dead center of the lever, thereby decreasing the frictional resistance of this spring against the back of the standard as the weight of the sash becomes more effective on the lever during the middle part of its stroke, but when the stud moves from the lower part of the cam face toward the high part thereof the compression of the spring R is increased as well as the thrust of the same against the back of the standard, in the same measure as the stud approaches the dead center and renders the load of the sash on the stud less effective owing to the less favorable position at this time of the stud relative to the axis of the lever. It follows from this that as the load of the sash on the lever increases, the tension on the spring R is decreased and as the load of the sash on the lever decreases the tension on the spring is increased, thereby causing a practically uniform load on the lever throughout its stroke. Quick movement of the lever by the operator during the final part of its stroke in either direction is thus prevented with the result that the lever is not liable to be broken which otherwise would be liable to occur if the lever were arrested suddenly at the end of its stroke while under high speed.

It is desirable to increase the frictional resistance gradually as the lever moves from its central position toward either end of its movement in proportion to the variation in the load, but during the last part of the movement of the lever in either direction this resistance is suddenly increased so as to form a cushion stop for the lever and compensate for the considerably greater leverage which the stud at this time exerts on nearing the dead center. This variable rate of increase or decrease in resistance is preferably effected by constructing the cam face so that its high end is comparatively steep or rises comparatively abroupt and preferably on a curve, while the low part of the cam face is only slightly inclined, as shown in Fig. 4. By this means the compression of the spring R increases gradually and at the same rate as the lever leaves its central position but becomes suddenly pronounced during the last part of its stroke, thereby operating as a yielding stop for the lever and preventing breaking of the same and also avoiding noise while operating the window. The movement of the lever may be arrested at the end of its stroke in either direction by various means, for instance, by engagement of the upper part of the segment with the left hand wall of the pocket *o* in the standard.

It has been found in practice that persons in operating the window are liable to pull the hand lever away from the sash or crosswise of the axis of the lever for the purpose of turning the same horizontally in the frame and unless the lever is made very heavy the same is liable to be broken. In order to permit of such a pull on the hand lever while the sash is either raised or lowered without liability of breaking the same and without making the same unduly heavy, means are provided for interlocking the lever at the side of its axis with the sash. The means preferred for this purpose, which are shown in the drawings, comprise a pair of upwardly opening hooks or sockets *t*, *t* arranged on the outer side of the face plate on opposite sides of the lever bearing, and two hooks or lugs T, T arranged on opposite sides of the lever at the same distance from its axis as the sockets *t*, *t*. Upon turning the lever to the end of its stroke in one direction or the other, one of its hooks T engages with one of the sockets *t* of the sash face plate and interlocks these parts, so as to prevent the lever from being pulled away from the sash. As this interlocking connection between the lever and sash is near the handle at the outer extremity of the lever, the lateral leverage on the same is materially reduced and breakage of the same is prevented. The interlocking means between the lever and the sash also serves as means for arresting the movement of the lever at the end of its stroke in either direction.

It will be noted that this construction of pivot and lifting fixture comprises but very few parts, it dispenses with screw connections between the parts, and the same can be put on the market and applied to the sill of the frame and the bar of the sash in an assembled condition, thereby avoiding the liability of disarranging the parts which otherwise might occur.

I claim as my invention:

1. A window fixture comprising a sill plate adapted to be secured to the window sill and provided with a bearing opening, a sash plate adapted to be secured to the underside of the sash and provided with an opening and a face plate adapted to be secured to the side of the sash and provided with a bearing, an upright pin arranged in the opening of the sill plate, and having a standard arranged in the opening of the such plate, a supporting member rolling on said standard, and a lever having a hub journaled in the bearing opening of said face plate and provided with an eccentric stud which rests on said rolling member.

2. A window fixture comprising a sill plate adapted to be secured to the window sill and provided with a bearing opening, a support adapted to be mounted on the sash and provided with a guide opening, a pivot pin journaled in the bearing opening

of the sill plate and having a standard arranged within the guide opening of the sash plate, a rolling member engaging with said standard, and a lever adapted to be pivotally supported on the sash and having an eccentric part engaging with said rolling member.

3. A window fixture comprising an upright pivot member which is adapted to be pivotally mounted on the window sill so as to turn horizontally and upon which the sash is adapted to slide vertically, a rolling member operatively supported on the pivot member, and a lever adapted to be operatively mounted on the sash to turn vertically and having an eccentric part engaging with said rolling member.

4. A window fixture comprising a sill plate adapted to be secured to the window sill and provided with a bearing opening, an upright pivot pin journaled in said bearing opening and provided with a standard at its upper end having a shelf, a segment rolling at its lower end on said shelf, and a lever adapted to be pivotally mounted on said sash and having an eccentric stud which is journaled on the upper end of said segment.

5. A window fixture comprising a sill plate adapted to be secured to the window sill and provided with a bearing opening, an upright pivot pin journaled in said bearing opening and provided with a standard at its upper end having a shelf and a horizontal slot above the shelf, a segment rolling at its lower end on the shelf, and a lever adapted to be pivotally supported on the sash and having an eccentric stud which is journaled on the upper end of said segment and engages with the underside of said slot.

6. A window fixture comprising a sill plate adapted to be secured to the window sill and provided with a bearing opening, an upright pivot pin journaled in said bearing opening and provided with a standard at its upper end which is provided on its side with a pocket, a shelf at the lower end of said pocket and a horizontal slot at the upper end of said pocket, a segment arranged in said pocket and rolling at its lower end on said shelf, and a lever adapted to be pivoted on said sash to turn vertically and provided with an eccentric stud which is journaled on the upper end of the segment and engages with the upper side of said slot.

7. A window fixture comprising an upright pin adapted to pivotally connect the window sill and sash for turning the latter horizontally, a lever adapted to be pivotally mounted on the sash to turn vertically and having an eccentric part which is operatively connected with said pivot pin, and a tension device acting upon said lever in a direction lengthwise of its pivotal axis and varying the resistance to its rotary movement.

8. A window fixture comprising an upright pin adapted to turn horizontally on the window sash and provided with a standard on which the window sash slides vertically, a lever pivotally mounted on the sash to turn vertically and provided with an eccentric part which is operatively connected with said standard, and a tension device acting upon said lever in a direction lengthwise of its pivotal axis and varying the resistance to its rotary movement.

9. A window fixture comprising an upright pin adapted to turn horizontally on the window sash and provided with a standard on which the window sash slides vertically and which is provided with a horizontal slot, a face plate adapted to be secured to the sash and provided with a bearing opening, a lever having its hub journaled in said bearing opening and provided with a shoulder engaging said face plate and with an eccentric stud which projects through said slot, and a tension device for holding the shoulder of said lever against said face plate.

10. A window fixture comprising an upright pin adapted to turn horizontally on the window sash and provided with a standard on which the window sash slides vertically and which is provided with a horizontal slot, a face plate adapted to be secured to the sash and provided with a bearing opening, a lever having its hub journaled in said bearing opening and provided with a shoulder engaging said face plate and with an eccentric stud which projects through said slot, and a tension device for holding the shoulder of said lever against said plate comprising a spring mounted on said stud and bearing against the side of the standard opposite the hub of said lever.

11. A window fixture comprising a sill plate adapted to be secured to the window sill and provided with a bearing opening, an upright pivot pin journaled in said bearing opening and provided with a standard at its upper end which is provided on its side with a pocket, a shelf at the lower end of said pocket and a horizontal slot at the upper end of said pocket, a segment arranged in said pocket and rolling at its lower end on said shelf, a lever adapted to be pivoted on said sash to turn vertically and provided with an ecentric stud which is journaled on the upper end of the segment and engages with the upper side of said slot, and a tension device for moving the lever lengthwise of its axis toward said standard comprising a spring arranged on the stud and bearing against the side of the standard opposite the hub of the lever.

12. A window fixture comprising means for pivotally connecting the window sill and

sash to permit of turning the latter horizontally, means for raising the sash comprising a lever, which is more powerful in one position than in another, and means for equalizing the power required for turning the lever.

13. A window fixture comprising means for pivotally connecting the window sill and sash to permit of turning the latter horizontally, means for raising the sash comprising a lever mounted on one of said window members and having an eccentric part which operates against the other window member, and means for equalizing the power required for turning the lever.

14. A window fixture comprising means for pivotally connecting the window sill and sash to permit of turning the latter horizontally, means for raising the sash comprising a lever mounted on one of said window members and having an eccentric stud which operates against the other window member, and means for equalizing the power for turning the lever comprising a support having a cam face past which said stud is adapted to move, and a spring mounted on said stud and bearing against said cam face.

15. A window fixture comprising means for pivotally connecting the window sill and sash to permit of turning the latter horizontally, means for raising the sash comprising a lever mounted on one of said window members and having an eccentric stud which operates against the other window member, and means for equalizing the power for turning the lever comprising a support having a cam face past which said stud is adapted to move and which has a slightly inclined low part and a steeply inclined high part, and a spring mounted on said stud and bearing against said cam face.

16. A window fixture comprising a vertical pin adapted to turn in the window sill and having a standard on which the sash slides vertically and which is provided with a shelf and a cam face, a rolling member bearing against said shelf, a lever pivotally mounted on the sash to turn vertically and having an eccentric stud which bears against said rolling member and moves lengthwise of said cam face, and a spring mounted on said stud and held at one end against movement lengthwise of the axis of the lever while its opposite end bears against said cam face.

17. A window fixture comprising means for pivotally connecting the window sill and sash to permit of turning the latter horizontally, means for raising the sash comprising a lever, and means for interlocking said lever with the sash at the side of its axis comprising a hook arranged on the lever and a socket adapted to be mounted on the sash to receive said hook.

Witness my hand this 18th day of January, 1910.

CLINTON D. TABOR.

Witnesses:
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ANNA HEIGIS.